PRESS BULLETIN 495 *May, 1936*

UNIVERSITY OF FLORIDA
AGRICULTURAL EXPERIMENT STATION
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IMPERIAL MYCOLOGICAL INSTITUTE
21 NOV. 1936

BLACK ROT OF CABBAGE

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Black rot* is probably the most common, widespread and destructive disease of cabbage in Florida. It occurs also on most other cultivated crucifers, or members of the mustard family grown commercially in the state. These include cauliflower, turnips, rutabaga, mustard, radish, collard, kale, brussels sprouts, broccoli, kohl-rabi and cress. The disease is found in commercial plantings during fall, winter and spring and in abandoned fields and home gardens during summer. Thus, it is present somewhere all year. It also survives from one planting season to the next in the soil and on dead plant refuse.

The disease may originate in the seedbed from infected seed or infested soil and then be introduced into fields on the seedlings at transplanting time. The seedlings developing from infected seed may be stunted or killed in the seedbed. They may serve as a source of infection for numerous other seedlings and, although these may not show signs of the disease when transplanted, they may gradually die in the field. When not so severely attacked, they may produce heads of marketable size that show varying effects of the disease from irregular shaped heads to only a few local infection spots on some of the outer foliage leaves.

In the field the disease is spread from diseased plants to healthy ones by various agencies such as the blowing of dry infected leaves that have been shed from diseased plants, cultivating implements, spattering of rain water and running surface water. The bacteria are deposited on the leaves in the water supplied by rain, dew or guttation droplets appearing around the margins of the leaves during the night, and some of them enter the natural openings on the margins of the leaves at the end of the veins. Once within the veins of the plant they multiply rapidly and migrate toward the midrib and base of the leaf and may eventually invade the main stem. The invaded veins become blackened and gradually the surrounding tissue in the leaf becomes yellow and affected leaves often shed from the stem.

* Caused by *Bacterium campestris* (Pam.) E. F. S.

SYMPTOMS

Black rot may kill the seedlings before they emerge from the soil or the seedlings may show wilting and blackening of the cotyledons soon after emergence. Older plants, when infected through the margins of the leaf, show more or less V-shaped yellow areas, the angle of the V following a vein. These areas enlarge rapidly and the veins show a black or dark brown discoloration. The entire leaf may turn yellow, then brown, and drop off.

Bacteria pass down the water ducts of the leaf veins until they reach the stem, through which they migrate to the roots below and the leaves above. This type of infection usually kills young plants very rapidly, but older plants may survive throughout the season even though no head is formed, or if a head is formed it is so lopsided or irregular that it cannot be marketed. In more mature plants the only indication of the disease may be some slightly darkened vascular tissue in the veins and stems. These symptoms with some slight variations, may be found in all the previously mentioned crucifers.

CONTROL

Since the organism that causes black rot may live from one season to the next in the soil in addition to being carried on the seed, new land should be selected for the seedbed or old land should be disinfected with formaldehyde solution or steam before planting. The formaldehyde solution is made up by diluting one gallon of commercial formalin in 50 gallons water and should be applied when the soil is in a tillable condition at the rate of one-half gallon per square foot of soil surface and covered with canvas, tarpaulin or other material for 24 hours and should not be planted for 10 days to two weeks.

Seed should be disinfected by soaking them 20 to 30 minutes in a 1:1,000 solution of corrosive sublimate. The poison can be purchased at drug stores and one tablet in a pint of water makes the concentration mentioned above. The seed should be tied in cheesecloth bags, not more than one-third filled, and submerged in the solution and agitated sufficiently to remove all air bubbles. After treatment they should be washed in clear water, allowed to drain a few minutes and then spread out in the shade, where they will be exposed to air currents for drying. Do not use metal containers.

When the disease appears in the field, affected plants should be removed and general sanitation practiced to prevent the soil from becoming infested. Rotation should be practiced, especially in fields in which the crop was known to have suffered from the effects of the disease. A three- or four-year rotation will materially reduce heavy soil infestation.

If seedlings have to be purchased for planting, insist on obtaining ones that have passed inspection for this disease.